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THE SPECIES OF *PARONYCHIA* (CARYOPHYLLACEAE) IN VICTORIA

by

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SUMMARY

Two species of *Paronychia*, *P. brasiliiana* DC. and *P. franciscana* Eastwood, are naturalized in Victoria. Previous records of *P. chilensis* DC. are erroneous, and are due to misidentification of *P. franciscana*.†

METHOD

Except for one 1969 collection of *P. brasiliiana* DC. from Genoa, East Gippsland, Willis (1973) referred all Victorian material of *Paronychia* to *P. chilensis* DC. Black (1963) also referred Victorian collections to *P. chilensis* but Eichler (1965) altered this determination to *P. brasiliiana*.

To resolve the identity of the Victorian plants all Australian collections of *Paronychia* held by the National Herbarium of Victoria were examined. Two species were distinguished and, with the use of the revision by Chaudhri (1968), determined as *P. brasiliiana* DC. and *P. franciscana* Eastwood. Portions of nine representative collections were submitted to Dr. M. N. Chaudri, University of Islamabad, Islamabad, Pakistan, who kindly confirmed the identifications.

DISTRIBUTION

Paronychia brasiliiana DC.

The earliest Victorian collections held at Melbourne each bear a machine-printed, blue "Botanical Museum of Melbourne./Ferd. Mueller, Ph. & M.D." label annotated in unidentified handwriting with the locality of Melbourne Botanic Garden, but without collector or date. The collections were probably made before Mueller's death in 1896 and were possibly taken

* National Herbarium of Victoria.

† Only one other species of *Paronychia* has been recorded from Australia. This is *P. argentea* Lam., which Black (1963) reported for South Australia from "Palmer (Murray lands west of river)". J. P. Jessop (pers. comm., Nov. 1976) could not locate any voucher collection for this report at the State Herbarium, Botanic Garden, Adelaide, and therefore Black's identification remains unverified.

from cultivated material. The only Victorian collections of undoubtedly naturalized populations are from East Gippsland (Genoa, 1969; Maramingo Hill, 1970; Buchan-Bruthen road, 1971; Mallacoota, 1972) and from the Melbourne suburb of South Yarra (1977). Several collections from eastern New South Wales are also held at Melbourne.

SPECIMENS EXAMINED:

(C) indicates verified by Dr. Chaudhri. Victoria—(C) Melbourne Botanic Garden, anon., ? pre-1896 (MEL 503801; MEL 503803); Shrine of Remembrance, South Yarra, Melbourne, in lawn, *H. I. Aston 1998*, 3.iii.1977 (AD, CANB; MEL 515990; NSW); Maramingo Hill, East Gippsland, A.C. *Beaglehole* 33629, 9.viii.1970 (MEL 516547); Buchan-Bruthen road, at junction of Dead Horse Creek Road, East Gippsland, A. C. *Beaglehole* 37551, 23.iii.1971 (MEL 516548); Shrine of Remembrance, South Yarra, Melbourne, in lawn, *M. G. Corrick* 5836 and 5837, 2.iii.1977 (MEL 515989; MEL 515991); (C) Genoa, grounds of Forests Commission's office, *J. H. Willis* and A. C. *Beaglehole*, 11.xi.1969 (MEL 504925); Mallacoota, camping and picnic reserve on north slopes of township, *J. H. Willis*, 19.xii.1972 (MEL 504924). New South Wales—(C) Sydney, *W. V. Blewett*, 27.iii.1931 (MEL 504923); Paterson, *H. A. Fry*, 28.iv.1933 (MEL 504926 (=NSW 51881)); Guyra, a common prostrate weed which has become widespread at Guyra, *E. N. McKie* 2450, summer 1945-46 (MEL 504928 (=NSW 51882)); Between Cambewarra Mountain and Beaumont, west of Nowra, *J. H. Willis*, 22.iii.1954 (MEL 504927).

This species is native to southern Brazil, Uruguay, and north-east Argentine and is introduced in South Africa and Australia. In Australia there are verified records from Victoria, New South Wales, the Australian Capital Territory, and south-east Queensland. (Beadle, 1972; Beadle, Evans and Carolin, 1972; Burbidge and Gray, 1970; Chaudhri, 1968).

Paronychia franciscana Eastwood

The earliest collection held at Melbourne warrants exactly the same comment as that given for the earliest collections of *P. brasiliensis*. Apart from this early collection of possibly cultivated material there are collections of undoubtedly naturalized populations from within the Melbourne suburban area (1909, 1946, 1961, 1965) and from the following widespread country locations in Victoria—Werribee River (1917) and Diggers Rest (1917), approximately 30 km south west to north west of Melbourne; Bairnsdale district (between 1917 and 1930); Eldorado (pre-1919) and Londrigan (1936), 20 km and 10 km respectively east of Wangaratta; Bendigo (1949); Roke-wood/Shelford (1962), approximately 40 km south of Ballarat. There are no collections from other Australian States held at the National Herbarium of Victoria.

SPECIMENS EXAMINED:

(C) indicates verified by Dr. Chaudhri. Victoria—Melbourne Botanic Garden, anon., ? pre-1896 (MEL 503802); (C) Londrigan, *R. A. Black*, 16.xi.1936 (MEL 504934); (C) Werribee River, growing on banks, *C. French jr.*, 15.i.1917 (MEL 504936); (C) Near Diggers Rest, common along road, *C. French jr.*, 20.v.1917 (MEL 504930); Bairnsdale district, *T. S. Hart*, between 1917 and 1930 (MEL 504935); (C) Queens Park, Moonee Ponds, fairly plentiful, *J. P. McLennan*, 1909 (MEL 504931); Diamond Hill, Ben-

digo, F. Robbins, 29.x.1949 (MEL 516546); Shrine of Remembrance, Melbourne, lawns, R. V. Smith, ii.1946 (MEL); Shrine of Remembrance, lawns, R. V. Smith, 9.i.1961 (MEL); Eldorado, per H. B. Williamson, pre-1919 (MEL 504929); (C) At bridge on Warrambine Creek, between Rokewood and Shelford, J. H. Willis, 18.xi.1962 (MEL 504932); (C) South Yarra, J. H. Willis, 14.xii.1965 (MEL 504933).

P. franciscana is native to Chile and introduced in the vicinity of San Francisco, U.S.A., and in Australia (Victoria).

TAXONOMY

Chaudhri (1968) recognises 109 species of *Paronychia* Miller (1754). He places the three species considered here in the subgenus *Paronychia* (57 spp.), section *Paronychia* (56 spp.) and subsection *Paronychia* (39 spp.). Within this subsection Chaudhri maintains *P. brasiliiana* DC. (1804) and *P. franciscana* Eastwood (1901) as distinct but similar species in the series *Planitoriae* (2 spp.) and places *P. chilensis* DC. (1828) in the series *Paronychia* (29 spp.). All three species are thus closely-related, and confusion between them is understandable.

P. brasiliiana and *P. franciscana* share the following characters:—

Plant perennial, herbaceous, with a slender woody tap root 1.0–2.0 (–4.0) mm diameter. Stems to c. 30–35 cm long, to 1.5 mm diameter, much-branched, prostrate with ascending extremities, many-noded, the internodes <2.0 cm long and often only 2–few mm, glabrous to pubescent; basal parts somewhat woody with the leaves fallen showing knotted nodes bearing persistent stipule-bases. *Leaves* 4–10 mm long, sessile, opposite or appearing whorled or fascicled, narrow-elliptic to \pm oblanceolate, tapered to the base, acute, distinctly mucronate, moderately densely covered with forwardly-directed, simple hairs; mucro very slender, translucent, 0.3–0.9 (–1.0) mm long; leaf pair joined at the base on either side of the stem by a conspicuous, broad-lanceolate, acuminate, silvery-white, scarious stipule which splits longitudinally as growth proceeds, producing two half-stipules at the base of each leaf of the pair; leaves when fascicled each with two unsplit stipules at the base; *stipules* 2.5–6.5 mm long, with fine hairs along the margins. *Flowers* several together in pseudo-axillary clusters together with silvery, stipule-like bracts; clusters many along each stem, shorter than the subtending leaves. *Flower* near-sessile, with a cup-shaped receptacle (perigynous zone) 0.25–0.35 (–4) mm long, this receptacle much shorter than the sepals. *Sepals* 5, c. 1.0–1.4 (–1.65) mm long (excluding awn), erect to slightly spreading, continuous with the summit of the receptacle, oblong, with a broad, thickened median band and a membranous margin, strongly concave with a distinct apical hood and a prominent, stiff, slender awn arising from the back of the hood. *Petals* absent or rarely appearing as a minute translucent projection c. 0.1 mm long arising from the summit of the receptacle at the junction of two sepals. *Stamens* 5, opposite to and attached

at the base of the sepals, much shorter than the sepals; *filaments* filiform, c. 4.0 mm long; *anthers* c. 1.5 mm long, oblong, bilocular, dorsifixed, opening introrsely by longitudinal slits. Ovary superior, ovoid, inilocular with one ovule, minutely papillose particularly over the apical region; *style* very short and squat (almost absent) with two (rarely three) short, divergent, sometimes almost horizontal, stigmatic arms; *ovule* basal, amphitropous. *Fruit* an obovoid to subglobose utricle, c. 1.0–1.25 mm long x 0.85–1.1 mm broad, enclosed in the persistent calyx; pericarp membranous and rupturing at the base. *Seed* subglobose, smooth, dark.

The following key gives the distinctions between *P. brasiliiana* and *P. franciscana* as shown by the Australian collections examined. These distinctions agree in essentials with those given by Chaudhri (l.c.).

Flower clusters \pm *exposed*, the leaves and stipules of each node usually shorter than the succeeding internode and therefore not concealing the flower cluster at the node above. *Shoots* with the nodal leaves and flower clusters moderately spaced along the stem, the *internodes* clearly visible. *Flowers* glabrous, or with a few short hairs externally at the junction of two adjacent sepals with the receptacle. *Sepals* equal, glabrous, deeply-hooded, at maturity the median band usually turning dark reddish-brown and the margin white and scarious; *hood depth* (distance from apex of hood to insertion of awn) c. 0.3–0.4 (–0.5) mm, the scarious margin occupying c. one third to one half of this depth. *Awn* 0.5–0.85 (–1.0) (average 0.6) mm long, *spreading* at an angle of 10°–80° (mostly c. 40°) from the longitudinal axis of the sepal, mostly about half (40%–62%, average 55%) as long as the sepal length (sepal base to point of attachment of the awn) *P. brasiliiana*

Flower clusters mostly *concealed* by leaves and stipules, each internode usually shorter than the leaves and stipules of the node below. *Shoots* usually densely covered with overlapping leaves and stipules, the *internodes* hidden. *Flowers* with short hairs externally at the junction of two adjacent sepals with the receptacle, and also usually hairy on the receptacle and the sepal hood, also often sparsely hairy over the whole sepal. *Sepals* somewhat unequal, 3 with very narrow margins and glabrous to slightly hairy, 2 with broad white scarious margins and usually strongly hairy, particularly on the hood, including the hood margin; all 5 sepals at maturity with the median band usually light straw-brown; *hood depth* c. 0.2–0.3 mm. *Awn* 0.4–0.6 (–0.7) (average 0.5) mm long, *erect* to spreading at an angle of 0°–40° (mostly c. 10°), usually about one third (27%–45%, average 37%) as long as the sepal length *P. franciscana*

In brief, *P. franciscana* differs from *P. brasiliensis* in the (usually) more densely-clothed shoots giving a more compact, mat-forming habit, the flowers pubescent rather than glabrous, the somewhat unequal, paler, less deeply-hooded sepals, and the shorter, erect or near-erect awns.

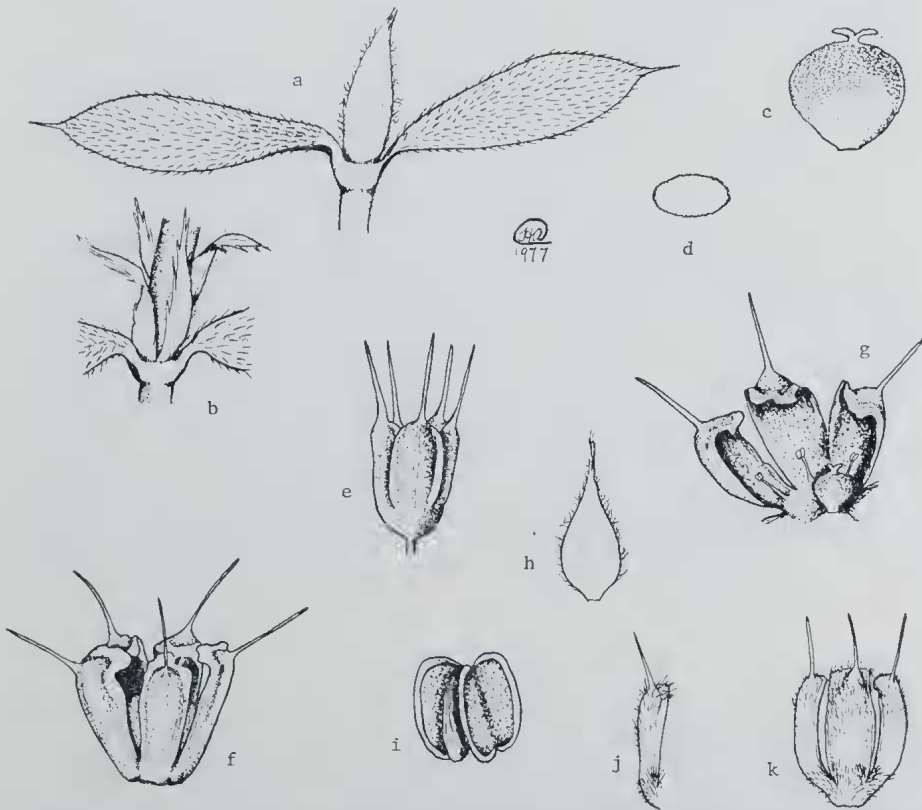


Fig. 1.—a-i, *Paronychia brasiliensis* (from Aston 1998): a—leaf pair connected by stipule at base, x 6; b—base of leaf pair showing the stipule split lengthwise to produce two half-stipules per leaf, x 6; c—papillate ovary with style and stigmas, lateral view, x 14; d—ovary, T.S., x 4; e—flower bud, the awns still erect, x 11; f—mature flower, external view, showing the very small receptacle and the 5 glabrous sepals each with a thickened median band, membranous margin, deep hood, and slender, spreading awn, x 11; g—portion of mature flower from within, showing 3 sepals, gynoecium, short receptacle, and stamens, x 11; h—stipule, x 10; i—anther after dehiscence, x 12. j-k, *Paronychia franciscana* (from Williamson, MEL 504929): j—one of the two broad-margined sepals, lateral view, x 11; k—portion of mature flower showing one broad-margined, strongly-hairy sepal and two narrow-margined, less hairy sepals. Note shallow hoods and short, erect awns, x 11.

Chaudhri (l.c.) also mentions very slight differences in internode pubescence and in styles, but these differences seem unstable. He gives larger stipules and very knotty shoots as further distinguishing characters for *P. franciscana*, but these

characters are not wholly reliable on the Australian material examined. However there is a tendency for larger stipules, shorter internode length, and a higher ratio of node diameter to internode diameter in some collections of *P. franciscana*. Coupling of the shorter internode and higher node/internode diameter ratio is more frequent in *P. franciscana*, and, where it occurs gives a more knotted appearance to the stem. This is most conspicuous over the lower stem portions from which leaves and stipules have fallen. Minimum, maximum and average measurements from the specimens seen are summarised as:—

P. brasiliانا—stipule length 2.5–6.5 mm (average 4.4); internode length 1.5–19.0 mm (average 9.8); ratio node: internode diameter 1.8:1 – 2.5:1 (average 2.2:1).

P. franciscana—stipule length 4.0–6.0 mm (average 4.9); internode length 2.0–12.0 mm (average 5.0); ratio node: internode diameter 1.6:1 – 4.0:1 (average 2.3:1).

Until now, *P. franciscana* has been identified in Victoria incorrectly as *P. chilensis*, but this latter species is distinguished from both *P. franciscana* and *P. brasiliانا* by the following characters:—

Receptacle well-developed, 0.8–1.0 mm long, only a little shorter than the sepal which is (excluding awn) 1.0–1.3 mm long; *petals present*, 0.25–0.3 mm long, subulate-filiform and indistinct; *awn short*, 0.25–0.3 mm. The first of these characters, the well-developed receptacle, is also the key distinction (Chaudhri, l.c.) of the series *Paronychia* from the series *Planitoria* (see opening paragraph under “taxonomy”).

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